

- mechanically mixing
  - (i) a minor amount of a binder, and
  - (ii) a major amount of spherical inorganic matrix particles ,
- forming the mixture into the desired shape,
- 5 • and exposing it for a time and at a temperature sufficient to solidify the mixture.

46. The method of claim 45 comprising the steps of

- mechanically mixing a major amount of spherical inorganic matrix particles with a minor amount of a binder selected from the group consisting of
  - (a) particulate organic thermoplastic polymers,
  - (b) liquid organic polymer resins, and
  - (c) aqueous solutions of alkali silicates
- forming the mixture into the desired shape, and
- 15 • treating the mixture for a time and at a temperature sufficient to
  - in case of (a), sinter the polymer, or
  - in case of (b), cure the polymer, or
  - in case of (c), harden the mixture.

20 47. The method of claim 45, wherein the mixture is formed into a mold.

48. The method of claim 45 wherein the mold has a structured surface obtainable by impressing a structured mastermold.

25 49. The method of claim 46 wherein the treating time is between about 0.5 h and about 30 h.

50. The method of claim 49 wherein the treating time is between about 0.5 h and about 25 h.

51. The method of claim 46 wherein the treating temperature is from  
5 between about 20°C and about 400°C.

52. The method of claim 51 wherein the treating temperature is from between about 100°C and about 250°C.

10 53. The method of claim 46 wherein the mixture is treated by gradually raising the temperature from about 20°C to about 400°C over a period of time from between about 5h and about 30h.

15 54. The method of claim 53 wherein the mixture is treated by gradually raising the temperature from about 20°C to about 250°C over a period of time from between about 5h and about 20h.

55. The method of claim 45 wherein the mixture comprises the inorganic particles and the binder in a weight ratio of about 100 : 10 to about 100 : 0.1.

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56. The method of claim 45 wherein the mixture comprises the inorganic matrix particles and the binder in a weight ratio of about 100 : 8 to about 100 : 1.0.

25 57. The method of claim 45 wherein the mixture comprises the inorganic matrix particles and the binder in a weight ratio of about 100 : 8 to about 100 : 3.5.

58. The method of claim 45 wherein the mixture comprises a binder selected from the group consisting of organic polymers and alkali silicates.

59. The method of claim 58 wherein the organic polymer binder is selected  
5 from the group consisting of thermoplastic polymers.

60. The method of claim 58 wherein the organic polymer binder is selected from the group consisting of cured polymer.

10 61. The method of claim 58 wherein the alkali silicate is selected from the group consisting of sodium-water glasses, potassium-water glasses and mixtures thereof.

15 62. The method of claim 59 wherein the thermoplastic organic binder polymer is selected from the group consisting of polyether-ether-ketones (PEEK), polyvinylchloride (PVC), polypropylene (PP), polyethylene (PE), acrylonitrile-butadiene-styrene-copolymers (ABS), polycarbonates (PC), polymethylmethacrylate (PMMA), polyvinylidene fluoride (PVDF) and thermoplastic polyolefins (TPO).

20 63. The method of claim 60 wherein the cured polymer is selected from the group consisting of epoxy resins, polyurethane (PU) resins, alkyd resins, unsaturated polyester (UP) resins, melamine resins, vinyl ester resins, acrylate resins and phenolic resins.

25 64. The method of claim 45 wherein the inorganic spherical matrix particles are made of a material selected from the group consisting of aluminium, copper, iron, steel, titanium, platinum, manganese, zinc, bronze and other metal alloys, coal, glass, ceramic, quartz, silica, silicon carbide, tungsten